Best Practices For GIS Within King County

Document History

Date	Who	Description
6/25/2002	Christie Most	Submitted to GIS Technical Committee for approval.
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Table of Contents

Best Practices for GIS within King County

1. Introduction

The objective of the Best Practices Work Group was to identify and develop GIS best practices to 1) improve communication within the KCGIS community; 2) tighten data procedures and requirements; and 3) coordinate changes to hardware, software and applications.

Best Practice can be defined as; a high-performance way of achieving business goals and objectives that solves problems creates opportunities, and improves business results. For a Best Practice (BP) to be effective it must allow for the easy transfer of ideas, knowledge, and standards. Best Practices must also be flexible and adaptable to change as business needs and technology change.

The coordinated King County Geographic Information System (GIS) program "Best Practices" document provides practical guides as well as background documentation and data that support the recommendations and standards as prescribed by the Best Practices Work Group of the King County GIS Technical Committee.
This document is intended to be a living framework reflecting changes in data, software, hardware, and communication that affect all GIS users in King County government.

This document will use the following conventions and definitions with regards to GIS best practices within King County.
    Definition: the problem or issue
    Goal: the desired outcome of adhering to the best practice
    Best Practices: the set of policy or guidelines that should be followed
    Limitation: (when it occurs) Exception to the best practice

2. Best Practices for Communication of Events

    Definition: Because GIS encompasses many departments, data sets, and systems, it is imperative that good communication occurs between users, maintainers, developers and system administrators within the GIS community. A set of best practices has been developed for events that may require communication to the GIS community. Described below are appropriate communicative responses to common events. The events identified concern data, applications, hardware, software, and personnel, and have responses based on the method of communication and according to the appropriate audience and urgency of the message. Information in this section is summarized as a table in Appendix A.

    Goal: The goal of communication is to keep all GIS users, maintainers, developers and system administrators informed about events that may impact data, systems, applications and staff.

    Best Practices:

1. **Events (Includes scheduled events such as User Groups, GIS Day, Training etc)**
   Email GIS All - The event moderator adds to weekly e-mail digest prior to the event.
   User Group Announcement – The event moderator makes an announcement at the next meeting
   Website - The GIS Center posts current events on the front page in a timely manner.

2. **New Data Layer**
   Email GIS Datanews - The steward adds to weekly e-mail digest prior to the event.
   User Group Announcement – The steward makes an announcement at meetings during various stages of development including initial planning and posting.
   Website - The GIS Center posts the event on the front page in a timely manner.

3. **Change Data Layer**
   Email GIS Datanews - The steward adds to weekly e-mail digest prior to the event.
   User Group Announcement - The steward makes an announcement at the next meeting
   Website - The GIS Center posts the event on the front page in a timely manner.
   Changes that might affect existing production applications should be announced prior to the change.

4. **Delete Data Layer**
   Email GIS Datanews – The steward adds to weekly e-mail digest prior to the event.

User Group Announcement - The steward makes an announcement at meetings both before and after the event

Website - The GIS Center posts the event on the front page both prior to the event and after the event

5. **Data Corruption**

Email Steward –The discoverer e-mails steward upon discovery and includes geographic location.

Email GIS Datanews – The steward e-mails upon notification and includes geographic location and anticipated time of repair.

User Group Announcement – The steward makes an announcement at the next meeting

6. **Data Development Needs**

User Group Announcement – The requestor makes an announcement at a meeting.

7. **Plibrary Structure Change**

Email GIS Datanews – The DBA adds to weekly e-mail digest prior to the change.

User Group Announcement - The DBA makes an announcement at the next meeting.

Website – The GIS Center posts the event on the front page both prior to the event and after the event

8. **Planned Reboot Production Servers**

Email GIS All – The administrator adds to weekly e-mail digest prior to the event and sends out an e-mail reminder 24 hours before the event.

User Group Announcement - The meeting moderator announces the reboot schedule at the next meeting.

Website - The GIS Center posts the event on the front page prior to the event.

NT Broadcast Message – The administrator makes an announcement 15 minutes prior to event

Unix Broadcast Message - The administrator makes an announcement 15 minutes prior to event

Unix Login Message - The administrator adds to the login message when known.

9. **Unplanned Reboot Production Servers**

Email GIS Datanews – The administrator adds to the weekly e-mail digest a description and diagnosis of what occurred if known.

User Group Announcement – The administrator or DBA discusses at the next meeting.

10. **Staff Changes**

Email GIS All – The supervisor adds to weekly e-mail digest (use discretion).

User Group Announcement – The agency representative makes an announcement at the next meeting.

11. **Applications - New**

Email GIS All – The author adds to weekly e-mail digest during planning and when released.

User Group Announcement – The author makes an announcement at meetings during various stages of development including initial planning and release.

Website – The GIS Center posts the event in a timely manner.

12. **Applications - Changes**

Email GIS All – The author adds to weekly e-mail digest prior to the event

User Group Announcement – The author makes an announcement at the next meeting.

Website – The GIS Center posts the event in a timely manner.

Changes that might affect existing application functionality should be announced prior to the change.

13. **Hardware – Network Changes (IP Changes)**

Email GIS All – The administrator adds to weekly e-mail digest when known and just prior to event

Please see previous communication best practice if system reboot is required.

14. **Hardware – New Servers**

Email GIS Datanews – The administrator adds to weekly e-mail digest

User Group Announcement - The administrator makes an announcement at the next meeting.

Website – The GIS Center posts the event in a timely manner.

Please see previous communication best practice if system reboot is required.

15. **Hardware – Retire Servers**

Email GIS Datanews – The administrator adds to weekly e-mail digest

User Group Announcement - The administrator makes an announcement at meetings both before and after the event

Website – The GIS Center posts the event on the front page both prior to the event and after the event

Please see previous communication best practice if system reboot is required.

16. **Vendor Software Upgrades and Configurations**

Email GIS Datanews – The administrator adds to weekly e-mail digest when known and just prior to event

User Group Announcement - The administrator makes an announcement at meetings both before and after the event

Website – The GIS Center posts the event on the front page both prior to the event and after the event.

Please see previous communication best practice if system reboot is required.

3. Best Practices for Data and Metadata

The ultimate utility of any GIS is dependent on the quality, accuracy and consistency of the data in the system. Commitment to minimum standards and requirements for data will ensure that the data is acceptable and can be published and shared by all GIS users in King County. The following is a list of best practices for insuring the integrity of data within the King County Enterprise GIS.

Data Standards

Definition: Adherence to a set of standards will ensure integrity of the data.
Goal: Data should meet minimum standards prior to acceptance into a public library.
Best Practices:
1. All production data will be checked for projection, precision and topology prior to insertion into a public library.
2. Data already existing on a public server should be reviewed to determine if they meet the data standards indicated in this document. If not, appropriate archival or deletion should occur with notification provided as detailed in Section 2, Best Practices for Communication of Events.

Limitation: While non-production data should be the best available it may not adhere to these standards.

Quality Assurance of Data

Definition: Quality assurance concerns the enforcement of standards for data posted on a public server (i.e. production data).
Goal: All production data on a public server must meet minimum quality standards.
Best Practices:
1. Data submitted for posting to a public library will be tested for data standards compliance prior to posting. When data fail to meet the standards, the poster will be notified by email, with clear and concise descriptions of the reason for rejection along with possible solutions for alleviating the problems cited.

Limitation: Data not posted to a public server (i.e. non production data) need not adhere to these standards.

Data Access

Definition: Manage user access to GIS data, with the understanding that not all people need the same access for all data.
Goal: Give the appropriate people the appropriate roles and access for interacting with GIS data to prevent the duplication of effort and conflicting data layers.
Best Practices:
1. Provide separately maintained access for production and non-production data.
2. The steward should manage access to non-production data.
3. Shared data should be cataloged and indexed to meet minimum metadata requirements.

Limitation: Data for access by a single individual need not adhere to these best practices.

Data Refresh/Currency

Definition: Data currency standards concern the timeliness of review of all data posted on a public server, including data obtained from outside King County.
Goal: Data currency standards ensure data posted on public servers are either maintained with the most up-to-date data, are clearly identified as historical data, or are removed/archived.
Best Practices:
1. The data steward should assume the following responsibilities with regards to posting data:
    a. Data that can become obsolete or inaccurate over time must be updated at an interval appropriate to keeping the data current.
    b. If new data sources are not available for updating a data set, the steward may take one of two actions:
        i. Following the appropriate notification procedures as detailed in Section 2, Best Practices for Communication of Events, the data steward changes the data set filename to indicate the approximate year of the data set (e.g. census blocks => blocks90). In addition, the data

steward makes clear notations in the data set's metadata regarding the historical nature of the data set and the lack of foreseeable updates.
  ii. Using the appropriate notifications as detailed in Section 2, Best Practices for Communication of Events, the data steward removes the data set from the public data server and evaluates it for either archival or deletion.

2. Data stewards updating data should follow the notification procedures detailed in Section 2, Best Practices for Communication of Events.

3. When an update occurs in one data set that is the source for derivative data sets (e.g. wtrcrs is the source for the simpler cartstrm), all data sets should be updated concurrently.

Limitation: Data that do not become invalid through time are exempted from this requirement, provided that an appropriate explanation about the lack of updates is clearly noted in the metadata.

Data Publication/Currency on Internet or CD

Definition: Publishing the most current data prevents confusion among KCGIS users and the public.
Goal: Data published to high traffic/visibility venues should be the most current available.
Best Practices:
1. Data published on the web should be refreshed on a regular schedule agreed upon by the GIS Center, Technical Committee and data stewards.
2. All data produced on the web should have dates associated with the data so users know what currency limitations may apply.
3. Prior to publishing data, the publisher should notify the author/owner of the data that the data would be accessible from a web application.

Limitations: NONE

Data Duplication

Definition: Data duplication standards concern instances where there appears to be multiple occurrences same information in separate data sets posted on the public server.
Goal: Data duplication standards ensure that duplication of information in different data sets occurs only when the data sets have clearly divergent and defined differences in purpose.
Best Practices:
1. The data steward should assume the following responsibilities in regards to said data:
   a. Before posting a new data set, an informal evaluation of currently available data should be completed. If another data set exists with similar information, the data steward of the new data should contact the existing data set's steward to determine whether the currently posted data set can be modified/updated/merged with the new data set to meet the identified needs.
   b. If data sets covering similar information must co-exist, the data stewards of those sets must:
      i. Coordinate where possible any data updates for portions of the data set which are similar between the data sets to avoid duplication of effort.
      ii. Clearly define in the metadata, with references to the similar data sets available, which data set is appropriate for which conditions and uses.

Limitation: NONE.

Mirrored Data

Definition: Data copied from a primary public server to a secondary public server for purposes of security, safety or other business needs.
Goal: To maintain data currency and keep datasets maintained on multiple public servers in sync.
Best Practices:
1. Mirrored copy should not be modified on the secondary public server.
2. New and/or changed data on the secondary server should be copied from the primary server weekly.
3. Since data stewards can not control and may be unaware of the copying of their data to other public servers, the responsibility for keeping the data on the secondary server concurrent with the source data falls upon the administrator of the secondary public server.
4. If data changes format, (i.e. from coverage to shapefile or Adobe Illustrator), the data must be QC'ed to ensure that the conversion did not corrupt the data. .
5. The database administrator on a primary server should be notified when a mirrored data set is created on a secondary server. Notification should include a contact name, frequency and timing.

Limitation: NONE

Procedural Documentation

Definition: The documentation of procedures that are predictable and recur over an extended period eases the transfer of job responsibilities between employees or across working groups.
Goal: Recurring procedures should be well documented.
Best Practices:
1. Annual work programs, both for individuals and for groups, should be evaluated for recurring, predictable procedures. When these procedures are identified, procedural documentation should be prepared and kept in a place that is readily accessible for all work group employees. Procedural documentation should be a step-by-step description of the tasks necessary to perform a given procedure, written in as much detail as possible.
2. The documentation should be maintained and accessible.
Limitation: It is not necessary, though it may be advisable, to document procedures for a non-recurring process.

Conversion to new data models

Definition: Successful conversion of spatial or tabular data from one format to another involves a well-formulated plan. The purpose of a data conversion plan is to lessen the potential negative effects and increase the potential positive effects that data conversions might have on projects and processes.
Goal: Any conversion of production data should include a conversion plan.
Best Practices:
1. When data conversions are proposed that will affect data stored for use by a work group of any size (as opposed to data stored and/or converted for use by a single individual), a data conversion plan should be created through a collaborative process with all affected parties. The data conversion plan should evaluate the current data format and data warehousing structure, the proposed data format and data warehousing structure, a step-wise description of the proposed process of conversion, and any impacts on applications and operations that the conversion will have, along with proposed remedies for the identified impacts. Section 2, Best Practices for Communication of Events.
2. Data conversion plans are documents which evaluate the current data format and data warehousing structure, the proposed data format and data warehousing structure, the proposed process of conversion, and any impacts on applications and operations that the conversion will have, along with proposed remedies for the identified impacts.
3. Document data conversions in as thorough a manner as possible.
Limitation: It is not necessary, though it may be advisable, to document conversions of data sets that are only to be used for one project and/or by one person.

Data Stewardship:

Definition: Data stewardship refers to the act of managing data, including making sure that data are posted correctly and well documented to ensure proper interpretation and to safeguard against misuse or accidental loss. Data stewardship is distinct from data ownership, although in many cases they are the same. For instance, the owner may be the person who originally created the data set and knows the most about its content; whereas the steward is the person who is responsible for making sure the data is available and documented.
The primary identification for GIS data stewardship is by agency, and within that agency by person.
Goal: The goal of data stewardship is to have a clear point of contact and responsibility for each data layer.
Best Practices:
1. The person creating the non-spatial (i.e., database) components of a spatial layer should be listed in the metadata as a content contact.
2. Shared data must have a King County agency assigned to it to act as data steward.
3. An agency assuming stewardship for a data layer must name one current staff person to act as primary contact for that layer. An optional secondary contact is also recommended.
4. If the primary contact did not create the data layer, he/she should at least be knowledgeable enough to answer general questions, and find more information (where appropriate) if needed.
5. Others wishing information about a layer beyond what is documented should contact the contact person(s) for that layer.
Limitation: NONE

Metadata Content

Definition: Metadata are a valuable resource of information about the data so both users and maintainers have a clear understanding of the who, what, when, why, and where issues relative to data maintenance, collection and use. An overview of the Content Standard for Digital Geospatial Metadata (CSDGM) can be found online at http://www.fgdc.gov/metadata/contstan.html. This document also contains links to the most recent version of the content standard (FGDC-STD-001-1998).

The CSDGM consists of seven sections:

1.	Identification Information	Basic information about the data set.
2.	Data Quality Information	A general assessment of the quality of the data set
3.	Spatial Data Organization Information	The mechanism used to represent spatial information in the data set.
4.	Spatial Reference Information	The description of the reference frame for, and the means to encode, coordinates in the data set.
5.	Entity and Attribute Information	Details about the information content of the data set, including the entity types, their attributes, and the domains from which attribute values may be assigned
6.	Distribution Information	Information about the distributor of and options for obtaining the data set.
7.	Metadata Reference Information	Information on the currentness of the metadata information, and the responsible party.

Each section consists of a hierarchy of data elements and compound elements which detail the information contained in that section. Metadata must contain only sections 1 and 7 to meet minimum FGDC compliance.

Goal: Current, descriptive metadata adhering to content standards should be maintained for all shared data sets.

Best Practices:

1. Data that resides in a public library must have FGDC compliant metadata attached. The following pieces of information about the data are required:
    a. Identification Information:
       Citation: Originator (Agency and Contact person), Publication Date, Geospatial Data Presentation Form
       Description: Abstract, Purpose, Access Constraints, Use Constraints, Native Data Set Format
       Time Period: Currentness Reference and Date
       Status: Progress, Update Frequency
       Spatial Domain: Bounding Coordinates (N,S,E,W)
       Keywords: Them
       Point of Contact: Agency and Contact person (name, organization, phone number required, email address recommended)
    b. Spatial Reference:
       Horizontal Coordinate System Information
    c. Entity and Attribute:
       For each entity type, Label is required, Definition is recommended. For each attribute within each entity type, Label and Definition are required
    d. Metadata Reference:
       Metadata Date
       Metadata Standard Name
       Metadata Contact Person (name, organization, phone number required, email address recommended).
2. The following pieces of information are recommended:
    a. Data Quality Information:
       Attribute Accuracy Report
       Completeness Report

Positional Accuracy: Horizontal Positional Accuracy (Vertical also if needed)
Source Information
Process Step: Process Definition
    b.   Distribution Information
    Distributor: Contact Person (name, organization, phone number required, email address recommended)
    Distribution Liability
3. The following pieces of information may be included if available / as time permits:
    Spatial Data Organization Information
    Other subsections of the FGDC standard that are not explicitly listed above.
4. Shared data that is not production quality should have minimally purpose, steward/author, limitations and date.

Limitation: NONE

Metadata Layout and Availability

Definition: FGDC makes no specification on metadata format or layout. However, a number of tools have been developed and are widely available through the Internet that parse a standard layout (often referred to as "FGDC-standard"). Unfortunately, this layout is difficult to read and understand, especially by laypersons.

Goal: Metadata should be made available in a layout that is relatively easy to decipher by non-metadata savvy GIS professionals and laypersons ("human-parseable").

Best Practices:
1. Metadata shall be made available in FGDC-standard layout.
2. For data in a public library, all formats for metadata shall be made available on the GIS website.
3. Public library data that is distributed beyond the King County Enterprise GIS shall have FGDC-standard metadata attached. It is recommended that the "human-parseable" metadata are included as well

Limitation: NONE

Metadata Storage

Definition: ArcInfo 8.x metadata are stored as XML. Metadata for SDE layers are stored in a database, while coverage and shapefile metadata are stored with the data.

Goal: Metadata should be stored with its parent data set.

Best Practices:
1. XML data shall not be moved away from its parent data set.

Limitation: NONE

4. Best Practices for New Technologies Hardware / Software / Applications

Hardware Upgrades

Definition: Upgrades to hardware used by a GIS cover replacement of individual components or the entire system. These may be driven by the need for increased performance, greater capacity, or as a result of hardware failure.

Goal: Hardware upgrades should ensure that hardware meets business needs with regard to performance, capacity, reliability, and supportability.

Best Practices:
1. The cost of hardware upgrades should be justified against improved performance, capacity, reliability, and supportability needs.
2. Hardware upgrades should be accomplished with the minimum disruption to users.
3. Only qualified technicians should perform hardware upgrades.
4. Systems should be monitored more closely following a hardware upgrade to insure anticipated performance.
5. New components or systems should be fully tested prior to deployment in production.
6. Documentation of changes to systems or the specifications of new systems should be maintained.

7. Where possible multiple components should be replaced separately with each replacement followed by adequate testing to ensure the new component is functioning properly.
8. Notification of staff regarding planned hardware upgrades should adhere to the best practice for the communication of events as outlined in this document.
9. Operating system and software requirements should be considered when upgrading hardware.
10. Hardware upgrades that involve full server replacement are best accomplished with a written plan that minimally documents timing, notification, transfer of data, users and applications, testing, troubleshooting, and implementation.

Limitations: Best Practices listed here are most applicable to multi-user server platforms, but they are also recommended for single-user desktop computers.

Software Upgrades

Definition: Upgrades to software cover replacement of the operating system, vendor off-the-shelf GIS products, and internally developed GIS applications. These may be driven by hardware upgrades (see above), the need for new/different functionality, or GIS software maintenance releases.

Goal: Software upgrades should ensure that software meets business needs with regard to functionality.

Best Practices:
1. The cost of software upgrades should be justified against improved functional needs.
2. Software upgrades should be accomplished with the minimum disruption to users.
3. Software upgrades should be performed by or under the supervision of qualified technicians.
4. Systems should be monitored more closely following a software upgrade to insure anticipated performance.
5. New software should be fully tested prior to deployment in production.
6. Documentation of changes to systems or the specifications of new systems should be maintained.
7. Notification of staff regarding planned software upgrades should adhere to the best practice for the communication of events as outlined in this document.
8. Operating system requirements should be considered when upgrading software.
9. Upgrades to the operating system should be accompanied by a re-installation of software and developed applications where necessary to maintain functionality of the existing environment.
10. User training should be provided to correspond with software upgrades.
11. Software upgrades that involve replacement of the software, database, and developed applications are best accomplished with a written plan that minimally documents timing, notification, transfer of data and users, installation, testing, troubleshooting, and implementation.

Limitations: Best Practices listed here are most applicable to multi-user server platforms, but they are also recommended for single-user desktop computers.

Test Environments

Definition: A test environment provides a means for evaluating the reliability, functionality, and compatibility of hardware, operating system, developed applications and data, and vendor software.

Goal: A separate test environment helps ensure the integrity of the production environment.

Best Practices:
1. Any production environment should have a corresponding test environment.
2. The test environment should mirror the production environment in all aspects including operating system and vendor software versions, user permissions, and directory structure.
3. Where necessary software upgrades (see above) should be implemented and fully tested in a test environment before implementing in production.
4. To maximize available resources, the test environment may serve for other functions such as development activities, storage for large non-production data, failsafe for production, etc.
5. The test environment should be used to test the impact of installation on servers (or desktops) and pre-existing applications, database, networking software, etc. Every attempt should be made to identify conflicts between software components outside of the production environment.

Limitations: NONE

Application Quality Assurance

Definition: Applications can be rated for utility based on a number of criteria. These include performance, available functions, user requirements, the rate of occurrence of faults, etc. Quality assurance is a process by which applications are assured of meeting minimum specifications for these criteria.

Goal: Application quality assurance should ensure quality in application operation.

Best Practices:
1. Applications and application modifications should be fully tested including the install process prior to deployment in production.
2. Where possible, applications and application modifications should be subject to minimal usability testing (5 users) prior to deployment in production.
3. Consideration to documentation, install procedures, support, communication with LAN or system support personnel, permissions should be made when deploying applications.
4. Applications should be tested on all target environments.

Limitations: NONE

User Accounts

Definition: A user account on a system (UNIX or NT/PC) enables access to a computer system for a specific user with specific privileges.

Goal: New user accounts will have the same name for both network and e-mail regardless of the operating system the account is created on.

Best Practices:
1. User names will adhere to the X.500 standard which maintains the same username for both network and e-mail.
2. Usernames should be less than sixteen characters.

Limitations: NONE

5. Best Practices for Database Development

The value of data is retained and further leveraged by making it well organized, understandable, available, current, accurate, and complete. Database system design and implementation are essential to the success of an enterprise GIS.

This is a subset of industry standards for database development.   Please refer to standards documented elsewhere for more comprehensive treatment of this subject.

Metadata

Definition: Summary and descriptive information for a database object.

Goal: To convey the meaning of a data set through proper documentation.

Best Practices:
1. Each table, field, stored procedure or query should include with it a short description explaining what it is. GIS layers must conform to metadata standards defined elsewhere in this document.

Limitations: NONE

Normalization

Definition: Each entity definition describes only one type of entity.

Goal: To achieve efficient data storage and retrieval through elimination of redundancy within and inconsistent dependencies among database objects.

Best Practice:
1. 3rd Normal Form.

Limitations: Where multi-field primary keys are required the reasons should be stated and fields documented

Key Fields

Definition: Unique identifier for a row in a table or view.

Goal: to assure ability to perform well-defined data selection.

Best Practice:

1. Determine a primary key field to uniquely identify each record in a table.
Limitations: in cases where it is necessary or preferable to use a compound primary key–a key composed of multiple fields–the rationalization for the key selection should be stated in the metadata.

Naming Convention

Definition: An explicit pattern to use when creating titles for database objects.
Goal: To assure readability, consistency and clarity there should be a naming convention for database objects such as tables, fields, sequences, and procedures.
Best Practice:
1. Follow ODBC guidelines for generality and portability: names should begin with a letter and consist only of letters, numbers and the underscore character. Spaces are not allowed.
2. Use meaningful words or phrases to name tables and fields.
3. Use consistent language across like databases, for example a field, which exists in multiple data sets, should have the same name in all instances, like "PIN" or "PARCEL_NUMBER" but not both.
Limitation: NONE

Standardized Date Format

Definition: Storing, processing and presenting data with varying or ambiguous date formats risks misinterpretation by users and misrepresentation in derivative forms due to improper date arithmetic calculations.
Goal: Standardize a clear and consistent date format in which to store and present date fields.
Best Practices:
1. Use the International Date Format for date fields. *ISO 8601:1988 International Date Format:* **'CCYY-MM-DD'** where **CC** is the century (representing the digits used in the thousands and hundreds components, as opposed to the actual century), **YY** is the year, **MM** is the month of the year between 01 (January) and 12 (December), and **DD** is the day of the month between 01 and 28 or 29 or 30 or 31, depending on length of month and whether it is a leap year. These dates are using the Gregorian calendar. For example: *2001-01-15* is the fifteenth of January in the year two thousand and one A.D.
Limitation: NONE

Validation

Definition: Testing data against defined constraints before committing it to storage.
Goal: To assure that data contained in a data set is valid.
Best Practices:
1. Data entered are checked for data type and if available acceptable range as well. Non-compliant entries are rejected.
Limitation: NONE

Historical Data

Definition: Valid enterprise data or project data no longer used for current business.
Goal: To retain access to historical data without compromising performance of production systems.
Best Practices:
1. Production systems should be purged of historical data that are determined to be obsolete.
2. Obsolete historical data should be archived to a reasonably stable medium in a recoverable format and stored outside of the production system.
Limitation: NONE

Database Implementation

Definition: The purpose of a database is to provide multi-user access to large amounts of data. The contents of the database are always changing to meet the changing needs of its users. Many significant database changes require that the database be unavailable while the change is implemented. The value of the database is unrealized for the duration of the operation of implementing the change. With proper planning and preparation unavailability of the database will be kept to a minimum.

Goal: To implement database changes with minimal service downtime.

Best Practices:
1. Create and follow a specific plan when making changes to database structure. The plan should include the following steps:
   a. Instantiate new database structure
   b. Load sample data
   c. Test relationships and applications of new and existing database features
   d. Back up existing production version
   e. Roll new design into production system
   f. Once new integrated system is demonstrated to be effective, remove the prior version

Limitation: NONE

6. Best Practices for GIS Professionals

Individual Development

Definition: Acquiring or enhancing skills for the individual GIS professional.
Goal: To maintain a highly motivated, skilled and productive workforce of GIS professionals within King County.
Best Practices:
1. Preliminary schedules for training should be produced as major changes to the production environment are planned.
2. Training for new Hardware, Software, or Applications should be available shortly in advance of their implementation in the production environment. Individuals should take on the responsibility for maintaining skill currency through appropriate training.
3. Professional development objectives are tied to industry skill standards, where these exist.
4. Training programs are developed with input from county organizations with GIS professionals on staff.
5. Professional development addresses both occupational skill requirements and the academic or foundational knowledge, skills, and behaviors that underlie them.
6. Professional development supports forms of work organization that emphasize broadening worker skills.
7. Professional development is based upon an assessment of the target population's knowledge, skills, and abilities.
8. Evaluations should be conducted regularly to ensure that professional development remains on track.

Limitation: Complex nature of implementation schedule requires flexibility in preliminary training schedule.

Organizational Involvement

Definition: Encourage staff awareness and participation in enterprise activities.
Goal: to be informed about GIS activities within King County and educated in the changing technology
Best Practices:
1. Access the KCGIS web site weekly for GIS update information.
2. Attend appropriate KCGIS sponsored User Group meetings
3. Maintain an awareness of Technical Committee activities and recommendations.
4. Implement countywide GIS standards as appropriate.
5. Contribute to discussions to improve GIS within King County through open dialogue.

Limitation: Efforts should be made to open channels for positive dialogue**.**

7. Glossary

Accuracy – The degree to which data represent the real world whether it regards geographic location or attribute.

*Author (Originator***)** –The person who created the original data structure and content, has no particular database rights unless is also the steward. (usually the same as the Steward except for 3rd party data reasonably intact)

Currency (Currentness) – The degree to which data represent the real world as it exists at the most recent moment in time

Data set - One or more tables or spatial layers together with their metadata

Data Steward (Owner) – The person responsible for the maintenance of a data set who controls content, currency, and access to that data set.

Database Administrator (DBA)– The person who provides access to data, and moderates content, structure and location of data

Derivative – A data set created as a subset or modification of an existing data set.

FGDC – The Federal Geographic Data Committee (FGDC) is an interagency committee, organized in 1990 that promotes the coordinated use, sharing, and dissemination of geospatial data on a national basis.

GIS Professional –An individual whose main function in the County is the creation, maintenance, and analysis of GIS Data

GIS User – An individual who uses GIS to any degree but whose main function in the County is not the creation, maintenance, and analysis of GIS data

Integrity – The measure of data that indicates its usable condition

Metadata - Definitional data that provide information about or documentation of other data managed within an application or environment.

Poster (Publisher) – The person responsible for the publication of a data set to the data warehouse .

Production data – Data which are as current and accurate as possible and suitable for, use on an enterprise-wide level.

Production Environment – A computing environment available to multiple users, tested and stable for daily use.

Project Data – Data sets created or developed for specific projects which may not be suitable for broader purposes

Public - Accesses data in the warehouse without authentication and typically has extremely limited privileges.

Public Library - Data housed on a central server that is accessible to all of King County government, the contents of which are accessible according to privileges assigned by data stewards.

Public Server- A computer system that is accessible to all of King County government, the access to which is assigned by the DBA.

Qualified Technician -- An individual who has been adequately trained in the installation/maintenance of the hardware, software, database, or applications.

Test Environment – A computing environment available for developing and testing of new/revised applications and software

Testing data – Data being developed that are not ready for enterprise-wide use but will be in the future